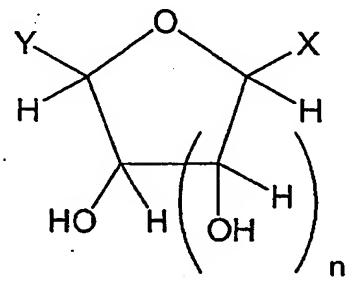
Claims:

1. A method of inhibiting or effecting protein kinase activity which comprises contacting a protein kinase with a compound of formula I being a derivative of a furanose or pyranose form of a monosaccharide, or a pharmaceutically acceptable salt thereof



formula I

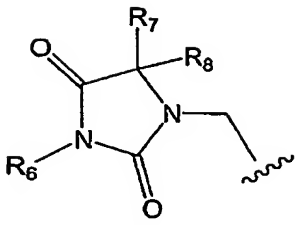
Wherein;

n is 1 or 2,

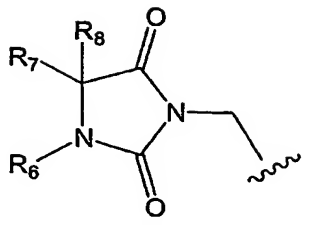
X is selected from the group consisting of : OR1, an unsubstituted 5 or 6 membered heterocyclic moiety, a substituted 5 or 6 membered heterocyclic moiety, an unsubstituted 9 or 10 membered heterobicyclic moiety and a substituted 9 or 10 membered heterobicyclic moiety ,

R1 is selected from the group consisting of: C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl and C3 to C14 heteroarylalkyl,

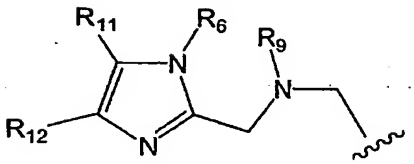
Y is selected from the group consisting of an unsubstituted 5 or 6 membered heterocyclic moiety; a substituted 5 or 6 membered heterocyclic moiety, an unsubstituted 9 or 10 membered heterobicyclic moiety and a substituted 9 or 10 membered heterobicyclic moiety; an amino acid, a dipeptide, and



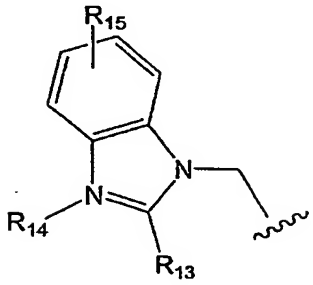
A



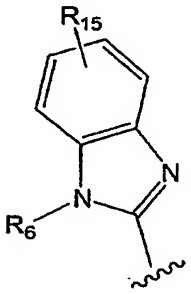
B



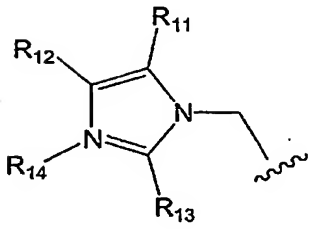
C



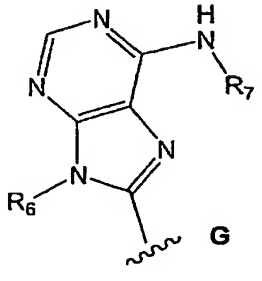
D



E



F



G

R6 is selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl or C3 to C14 heteroarylalkyl,

with the proviso that R6, R7 and R8 are not all H,

R9 is selected from H, or –(CO)-R6,

R7, R8, R11, R12, R14, are independently selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 acyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C6 to C14 arylacyl, C6 to C14 heteroaryl, C6 to C14 heteroarylacyl, C6 to C14 arylalkyl and C6 to C14 heteroarylalkyl,

R13 is selected from the group consisting of :unsubstituted phenyl unsubstituted benzyl, substituted phenyl, substituted benzyl, H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 acyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C6 to C14 arylacyl, C6 to C14 heteroaryl, C6 to C14 heteroarylacyl, C6 to C14 arylalkyl or C6 to C14 heteroarylalkyl, -S-R6 and –O-R6,

R15 is absent or is at least one substituent on the aromatic ring which are independently selected from the group consisting of: OH, NO, NO_2, NH_2, N_3, halogen, CF_3, CHF_2, CH_2F, nitrile, alkoxy, aryloxy, amidine, guanidiniums, carboxylic acid, carboxylic acid ester, carboxylic acid amide, aryl, cycloalkyl, heteroalkyl, heteroaryl, aminoalkyl, aminodialkyl, aminotrialkyl, aminoacyl, carbonyl, substituted or unsubstituted imine, sulfate, sulfonamide, phosphate, phosphoramide, hydrazide, hydroxamate, hydroxamic acid, heteroaryloxy, alkyl, aminoaryl, aminoheteroaryl, thioalkyl, thioaryl and thioheteroaryl.

2. The method of claim 1, wherein R1 is substituted, cyclic or acyclic, branched and/or linear.

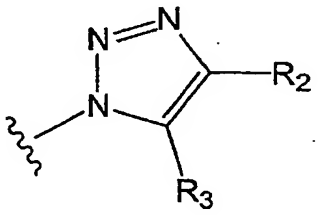
3. The method of claim 1, wherein R7 and R8 combine to form a cyclic structure.

4. The method of claim 1, wherein R6 and one of R7 or R8 combine to form a cyclic structure.

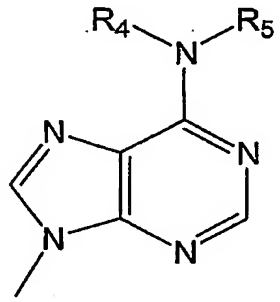
5. The method of claim 1, wherein R11 and R12 combine to form a cyclic structure,

6. The method of claim 1, wherein

X is selected from: OR1,



or



R1 and R3 are independently selected from the group consisting of: C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl and C3 to C14 heteroarylalkyl,

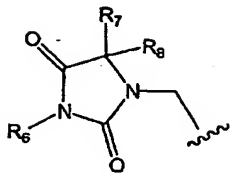
R4 is selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl and C3 to C14

heteroarylalkyl,

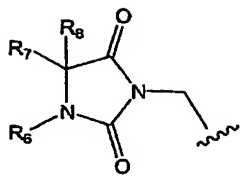
R5 is selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl or C3 to C14 heteroarylalkyl, C1 to C7 acyl, C6 to C14 arylacyl, and C3 to C14 heteroarylacyl,

R2 is selected from the group consisting of: –(C=O)-R3, -(C=O)-OR4, and -(C=O)-NH-R4,

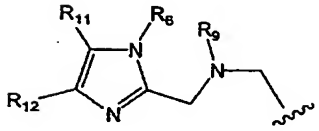
Y is selected from:



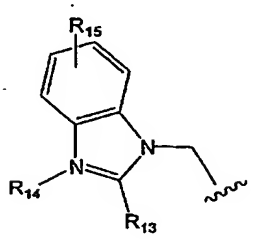
A



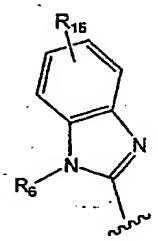
B



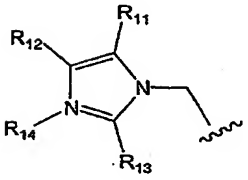
C



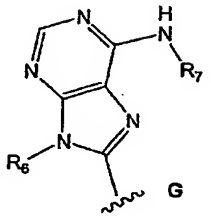
D



E



F



G

5

7 The method of claim 6, wherein at least one of R1 to R5 is substituted, cyclic or acyclic, branched and/or linear.

8. The method of claim 6, wherein R7 and R8 combine to form a cyclic

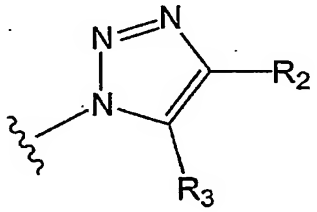
structure.

9. The method of claim 6, wherein R6 and one of R7 or R8 combine to form a cyclic structure.

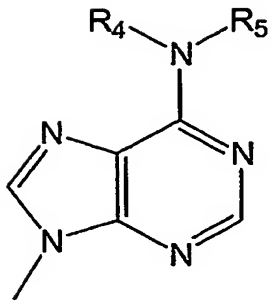
10. The method of claim 6, wherein R11 and R12 combine to form a cyclic structure.

11. The method of claim 1 and claim 6 wherein at least one of R1 – R14 is substituted and these substituents and the substituents on the substituted 5 or 6 membered heterocyclic moiety and the substituted 9 or 10 membered heterobicyclic moiety are selected from the group consisting of: OH, NO, NO_2, NH_2, N_3, halogen, CF_3, CHF_2, CH_2F, nitrile, alkoxy, aryloxy, amidine, guanidiniums, carboxylic acid, carboxylic acid ester, carboxylic acid amide, aryl, cycloalkyl, heteroalkyl, heteroaryl, aminoalkyl, aminodialkyl, aminotrialkyl, aminoacyl, carbonyl, substituted or unsubstituted imine, sulfate, sulfonamide, phosphate, phosphoramide, hydrazide, hydroxamate, hydroxamic acid, heteroaryloxy, alkyl, aminoaryl, aminoheteroaryl, thioalkyl, thioaryl or thioheteroaryl, which may optionally be further substituted.

12. The method of claim 1 wherein the group X is

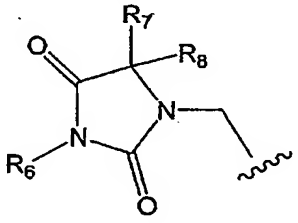


13. The method of claim 1, wherein the group X is



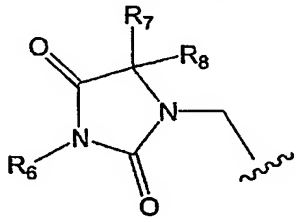
14. The method of claim 1, wherein X is –OR1

15. The method of claim 12 wherein the group Y is



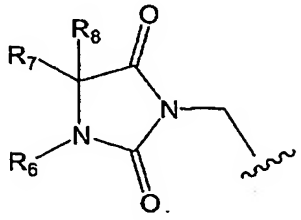
A

16. The method of claim 13 wherein the group Y is



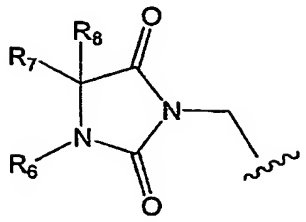
A

17. The method of claim 12 wherein Y is



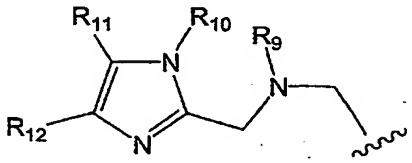
B

18. The method of claim 13, wherein Y is



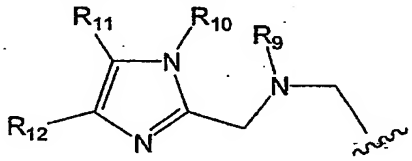
B

19. The method of claim 12, wherein Y is



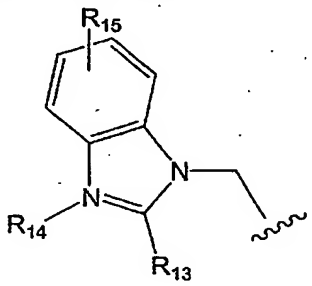
C

20. The method of claim 13 wherein Y is



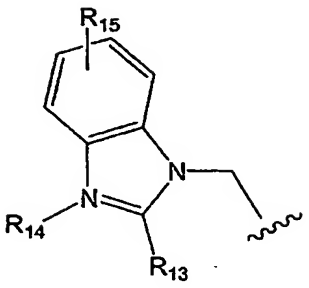
C

21. The method of claim 12, wherein Y is



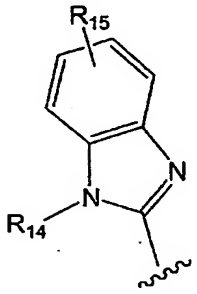
D

22. The method of claim 13, wherein Y is



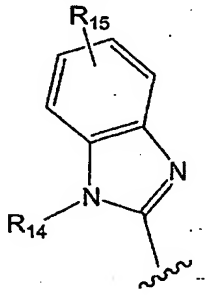
D

23. The method of claim 12, wherein Y is



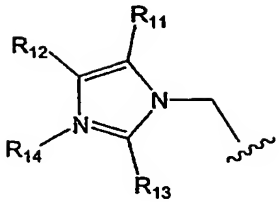
E

24. The method of claim 13, wherein Y is



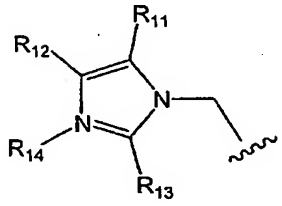
E

25. The method of claim 12, wherein Y is



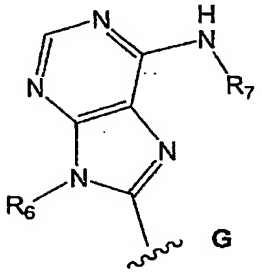
F

26. The method of claim 13, wherein Y is



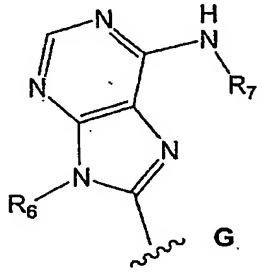
F

27. The method of claim 12, wherein Y is



G

28. The method of claim 13, wherein Y is



G

29. The method of claim 1 wherein the protein kinase is a serine or threonine kinase.

30. The method of claim 1 wherein the protein kinase is a tyrosine

kinase.

31. The method of claim 1 wherein the protein kinase is one or more of the isoforms of protein kinase C.

32. The method of claim 1 wherein the protein kinase is Tie-2, also known as TEK , HPK-6 , TIE-2 , VMCM , VMCM1.

33. The method of claim 1 wherein the protein kinase is c-Kit also known as SCFR , CD117 , PBT.

34. The method of claim 1 wherein the protein kinase is VEGF-R2/KDR also known as VEGFR2 , VEGFR-2 , VEGFR , Hs.KDR , Hs.12337 , FLK1 , FLK-1.

35. The method of claim 1 wherein the protein kinase is EGF-R also known as ERBB1 , ERBB, EGFRvIII.

36. The method of claim 1 wherein the protein kinase is Abl also known as c-ab1 , c-ABL, JTK7, p150, ABL1.

37. The method of claim 1 wherein the protein kinase is MET also known as HGFR , C-MET , RCCP2.

38. The method of claim 1 wherein the protein kinase is, CDK2 also known as p34CDK2 , p33CDK2, p33CDK2.

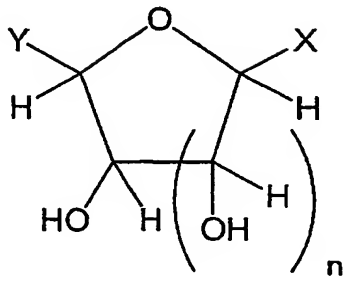
39. The method of claim 1 wherein the protein kinase is PDGF also known as PDGFR1 , PDGFR , PDGF-R-beta , JTK12 , CD140B , PDGFRB.

40. The method of claim 1 wherein the protein kinase is FGFR-1 also known as N-SAM , LOC51033 , FLT2 , FLJ14326 , CEK , C-FGR , BFGFR , H5 , H4 , H3 , H2 , FLG.

41. The method of claim 1 wherein the protein kinase is P38 MAP Kinase also known as p38alpha , p38ALPHA, SAPK2a, SAPK2A, PRKM15, PRKM14, Mxi2, MXI2, Exip, EXIP, CSPB1, CSBP2, CSBP1, p38, RK, P38, MAPK14.

42. A compound of formula I which is a derivative of a furanose form of a monosaccharide of general formula I,

120

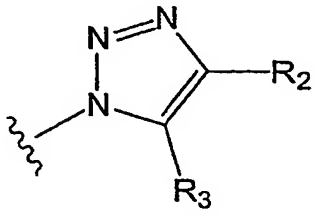


formula I

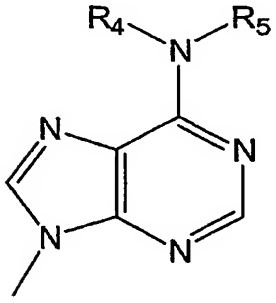
Wherein;

n is 1,

X is selected from: OR1,



or



R1 and R3 are independently selected from the group consisting of: C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl and C3 to C14 heteroarylalkyl,

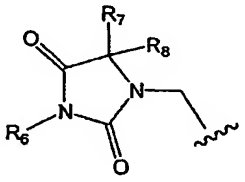
R4 is selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl and C3 to

C14 heteroarylalkyl,

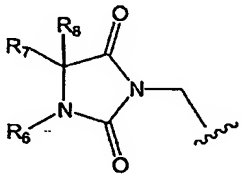
R5 is selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl or C3 to C14 heteroarylalkyl, C1 to C7 acyl, C6 to C14 arylacyl, and C3 to C14 heteroarylacyl,

R2 is selected from –(C=O)-R3, -(C=O)-OR4, -(C=O)-NH-R4,

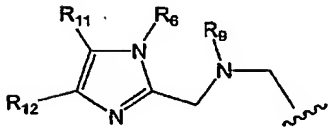
Y is selected from the group consisting of :



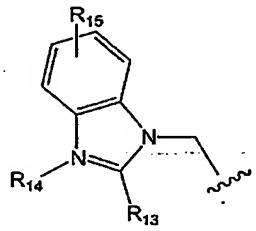
A



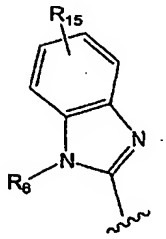
B



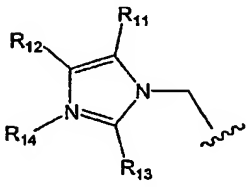
C



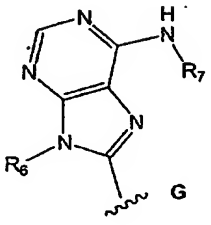
D



E



F



G

R6 is selected from the group consisting of H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C3 to C14 heteroaryl, C6 to C14 arylalkyl and C3 to C14 heteroarylalkyl,

with the proviso that R6, R7 and R8 are not all H,

R9 is selected from H, or –(CO)-R6,

R7, R8, R11, R12, R14, are independently selected from the group consisting of: H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 acyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C6 to C14 arylacyl, C6 to C14 heteroaryl, C6 to C14 heteroarylacyl, C6 to C14 arylalkyl or C6 to C14 heteroarylalkyl,

R13 is selected from the group consisting of: unsubstituted phenyl, unsubstituted benzyl, substituted phenyl, substituted benzyl, H, C1 to C7 alkyl, C1 to C7 alkenyl, C1 to C7 alkynyl, C1 to C7 acyl, C1 to C7 heteroalkyl, C6 to C14 aryl, C6 to C14 arylacyl, C6 to C14 heteroaryl, C6 to C14 heteroarylacyl, C6 to C14 arylalkyl or C6 to C14 heteroarylalkyl, -S-R6 or –O-R6,

R15 is absent or is at least one substituent on the aromatic ring which is independently selected from the group consisting of: OH, NO, NO_2, NH_2, N_3, halogen, CF_3, CHF_2, CH_2F, nitrile, alkoxy, aryloxy, amidine, guanidiniums, carboxylic acid, carboxylic acid ester, carboxylic acid amide, aryl, cycloalkyl, heteroalkyl, heteroaryl, aminoalkyl, aminodialkyl, aminotrialkyl, aminoacyl, carbonyl, substituted or unsubstituted imine, sulfate, sulfonamide, phosphate, phosphoramide, hydrazide, hydroxamate, hydroxamic acid, heteroaryloxy, alkyl, aminoaryl, aminoheteroaryl, thioalkyl, thioaryl or thioheteroaryl.

43. The compound of claim 42, wherein R7 and R8 combine to form a cyclic structure.

44. The compound of claim 42, wherein R6 and one of R7 or R8 combine to form a cyclic structure.

45. The compound of claim 42, wherein R11 and R12 combine to form a cyclic structure.

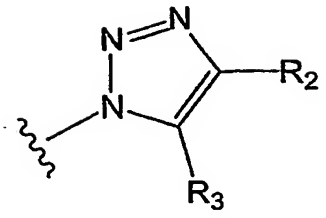
46. The compound of claim 42, wherein the groups R1, R2, R3, R4 and R5 are optionally substituted, cyclic or acyclic, branched and/or linear.

47. The compound of claim 42, wherein R2 and R3 combine to form a ring structure.

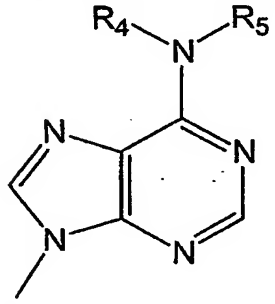
48. The compound of claim 42, wherein the groups R4 and R5 combine to form a ring structure.

49. A compound of claim 42 in which at least one of R1 to R14 is substituted with a substituent selected from the group, OH, NO, NO_2, NH_2, N_3, halogen, CF_3, CHF_2, CH_2F, nitrile, alkoxy, aryloxy, amidine, guanidiniums, carboxylic acid, carboxylic acid ester, carboxylic acid amide, aryl, cycloalkyl, heteroalkyl, heteroaryl, aminoalkyl, aminodialkyl, aminotrialkyl, aminoacyl, carbonyl, substituted or unsubstituted imine, sulfate, sulfonamide, phosphate, phosphoramide, hydrazide, hydroxamate, hydroxamic acid, heteroaryloxy, aminoalkyl, alkyl, aminoheteroaryl, thioalkyl, thioaryl or thioheteroaryl, which may optionally be further substituted,

50. The compound of claim 42 in which the group X is

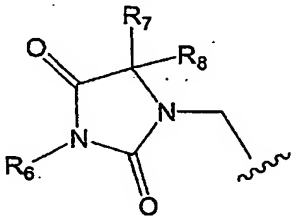


51. The compound of claim 42 in which the group X is



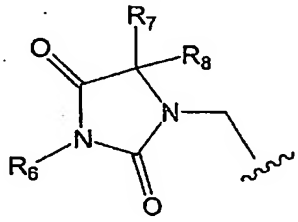
52. The compound of claim 42 in which the group X is –OR1.

53. The compound of claim 50 wherein Y is



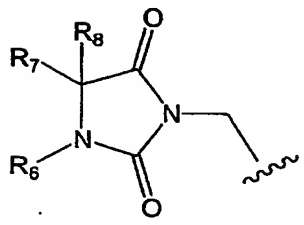
A

54. The compound of claim 51 wherein Y is



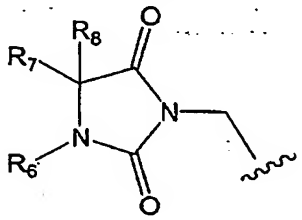
A

55. The compound of claim 50, wherein Y is



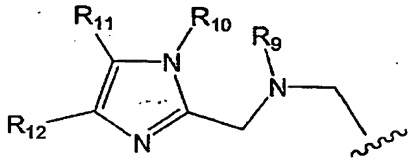
B

56. The compound of claim 51, wherein Y is



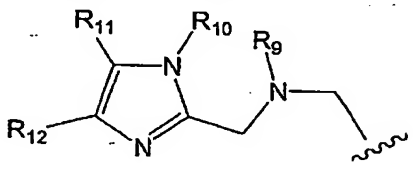
B

57. The compound of claim 50, wherein Y is



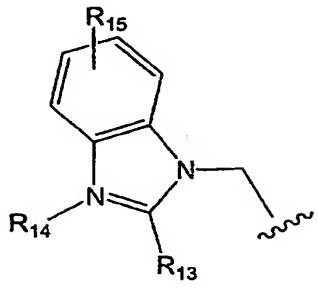
C

58. The compound of claim 51, wherein Y is



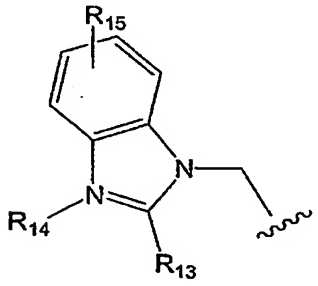
C

59. The compound claim 50, wherein Y is



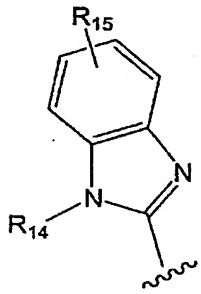
D

60. The compound claim 51, wherein Y is



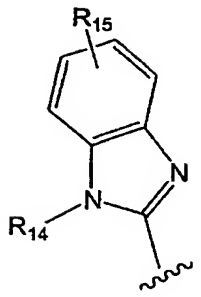
D

61. The compound of claim 50, wherein Y is



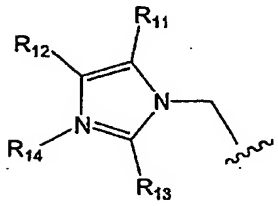
E

62. The compound of claim 51, wherein Y is



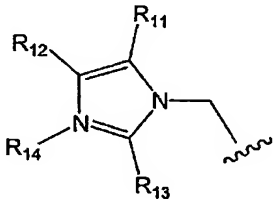
E

63. The compound of claim 50, wherein Y is



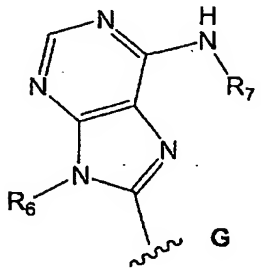
F

64. The compound of claim 51, wherein Y is



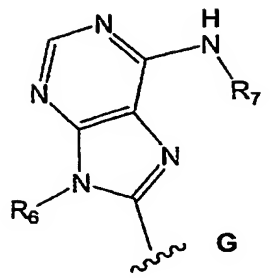
F

65. The compound claim 50, wherein Y is



G

66. The compound claim 51, wherein Y is


N
H
N
R7
N
N
N
R6
G